

## General

### Guideline Title

Occupational therapy practice guidelines for individuals with autism spectrum disorder.

### Bibliographic Source(s)

Tomchek SD, Koenig KP. Occupational therapy practice guidelines for individuals with autism spectrum disorder. Bethesda (MD): American Occupational Therapy Association, Inc. (AOTA); 2016. 97 p. [474 references]

### Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Tomchek SD, Case-Smith J. Occupational therapy practice guidelines for children and adolescents with autism. Bethesda (MD): American Occupational Therapy Association (AOTA); 2009. 132 p. [248 references]

This guideline meets NGC's 2013 (revised) inclusion criteria.

## Recommendations

### Major Recommendations

Note from the National Guideline Clearinghouse: In addition to the evidence-based recommendations below, the guideline includes extensive information on the evaluation process and intervention strategies for people with autism spectrum disorder (ASD).

Definitions for the strength of recommendations (A–D, I) and levels of evidence (I–V) are provided at the end of the "Major Recommendations" field.

#### Recommendations for Occupational Therapy Interventions for Individuals with Autism Spectrum Disorder (ASD)

Interventions for Social Skills, Social Communication, Restricted and Repetitive Behaviors, and Play Performance and Leisure Participation

- Group-based social skills training programs in both clinic-based and contextual settings to improve social skills (A)
- Picture Exchange Communication System (PECS) to improve social communication (A)
- Joint attention training to improve joint attention (A)
- Activity-based interventions to improve social skills (B)
- Computer-based interventions (social skills training, virtual reality, video modeling, and collaborative computer work) to improve social skills (B)
- Naturalistic behavioral interventions (e.g., milieu therapy, functional communication training, and pivotal response training) to improve social communication (B)

- Developmental interventions (e.g., relationship-based or floor time) to improve social communication (B)
- Parent-mediated interventions (e.g., parent-mediated communication-focused treatment, Autism 1-2-3) and imitation training to improve social communication (B)
- Behavioral techniques (e.g., antecedent manipulation, self-management) to improve restricted and repetitive behaviors (B)
- Physical activity (kata training and exercise) to decrease restricted and repetitive behaviors (B)
- Recess intervention, leisure group, and Social Stories to improve leisure participation (B)
- Use of preferred, focused, or restricted special interests to improve social behaviors (C)
- Play skill interventions (e.g., adult modeling and prompting; Developmental, Individual differences, Relationship-based model [DIR]–Floortime; pretend play) to improve play performance (C)
- Social Stories and peer-mediated interventions to improve social skills (I)
- Classroom-based interventions (e.g., Treatment and Education of Autistic and Related Communication Handicapped Children [TEACCH]) to improve social communication (I)
- Sensory–motor interventions to improve social communication (I)

#### Interventions for Sensory Integration and Sensory-Based Interventions

- Ayres Sensory Integration (ASI)® to address individualized goal areas with measurement by Goal Attainment Scaling (B)
- Multisensory activities to improve occupational performance and behavior regulation (B)
- ASI to improve sleep, adaptive skills, autism features, and sensory processing (C–I)
- Multisensory center and noncustomized sensory diets to improve occupational performance and behavioral regulation (I)
- Sound therapies to improve behavioral regulation (I)
- Dynamic seating to improve in-seat and on-task behavior and engagement (I)
- Linear movement or tactile input (via surgical brush) to improve learning or behavior (I)
- Environmental modifications (i.e., sound-absorbing walls and ceiling with additional halogen lighting) to improve attention behaviors, emotional control, and classroom performance (I)
- Weighted vests to support improved behavior or performance in daily life activities (D)

#### Interventions for Performance in Work, Activities of Daily Living (ADLs), Instrumental Activities of Daily Living (IADLs), and Education

- Video modeling and technology-enhanced visual supports and prompting to increase function and work performance (A)
- Cognitive–behavioral approaches to improve function in the areas of ADLs and IADLs (B)
- Cognitive Orientation to Daily Occupational Performance (CO–OP) approach to improve ADL and IADL function (C)
- Supported employment to improve work retention for young adults (C)
- Exercise to improve classroom behavior (C)
- ASI to reduce caregiver assistance needed for self-care skills (C)
- Supported employment to improve quality of life (I)
- Technology-enhanced interventions to support ADL performance (I)

#### Interventions for Parent Self-Efficacy, Family Coping and Resiliency, and Family Participation in Daily Life and Routines

- Behavioral interventions to improve parental self-efficacy, confidence, and competence (A, B)
- Parent training, education, and coaching to increase parenting skill and knowledge (B)
- Parent training, education, and coaching to improve family coping and resiliency and reduce parental stress (C)
- Behavioral interventions to decrease parental stress and family coping and resiliency (C)
- Relaxation and mindfulness training to reduce parental stress (I)
- Highlighting of strengths versus deficits of child to improve parent affect and interaction (I)

#### Definitions

##### Levels of Evidence for Occupational Therapy Outcomes Research

Levels of Evidence	Definition
<b>Level I</b>	Systematic reviews, meta-analyses, and randomized, controlled trials
<b>Level II</b>	Two groups, nonrandomized studies (e.g., cohort, case control)
<b>Level III</b>	One group, nonrandomized (e.g., before-after, pretest and posttest)

Level of Evidence	Definition
Level IV	Descriptive studies that include analysis of outcomes (e.g., single-subject design, case series)
Level V	Case reports and expert opinions, which include narrative literature reviews and consensus statements

Note: Adapted from "Evidence-based medicine: What it is and what it isn't." D. L. Sackett, W. M. Rosenberg J. A. Muir Gray, R. B. Haynes, & W. S. Richardson, 1996, *British Medical Journal*, 312, pp. 71-72.

### Strength of Recommendations

- A–There is strong evidence that occupational therapy practitioners should routinely provide the intervention to eligible clients. Good evidence was found that the intervention improves important outcomes and concludes that benefits substantially outweigh harm.
- B–There is moderate evidence that occupational therapy practitioners should routinely provide the intervention to eligible clients. There is high certainty that the net benefit is moderate, or there is moderate certainty that the net benefit is moderate to substantial.
- C–There is weak evidence that the intervention can improve outcomes. It is recommended that the intervention be provided selectively on the basis of professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.
- I–There is insufficient evidence to determine whether or not occupational therapy practitioners should be routinely providing the intervention. Evidence that the intervention is effective is lacking, of poor quality, or conflicting and the balance of benefits and harm cannot be determined.
- D–It is recommended that occupational therapy practitioners do not provide the intervention to eligible clients. At least fair evidence was found that the intervention is ineffective or that harm outweighs benefits.

Note: Criteria for level of evidence and recommendations (A, B, C, I, D) are based on standard language from the U.S. Preventive Services Task Force (2012). Suggested recommendations are based on the available evidence and content experts' clinical expertise regarding the value of using it.

### Clinical Algorithm(s)

None provided

## Scope

### Disease/Condition(s)

Autism spectrum disorder (ASD)

### Guideline Category

- Counseling
- Management
- Rehabilitation
- Treatment

### Clinical Specialty

- Family Practice
- Neurology
- Pediatrics
- Physical Medicine and Rehabilitation
- Psychiatry

Psychology

Speech-Language Pathology

## Intended Users

Advanced Practice Nurses

Nurses

Occupational Therapists

Physical Therapists

Physician Assistants

Physicians

Psychologists/Non-physician Behavioral Health Clinicians

Social Workers

Speech-Language Pathologists

## Guideline Objective(s)

- To provide an overview of occupational therapy interventions for individuals with autism spectrum disorder (ASD) that is based on existing evidence of the effects of various interventions
- To help occupational therapists and occupational therapy assistants, as well as the individuals who manage, reimburse, or set policy regarding occupational therapy services, understand the contribution of occupational therapy in providing services to individuals with ASD
- To help guide future decisions on areas for research by highlighting areas in which promising interventions may lack evidence of a clear benefit or in which available interventions fail to meet specific needs of clients with ASD
- To serve as a reference for health care professionals, health care facility managers, education and health care regulators, third-party payers, and managed care organizations

## Target Population

Individuals with autism spectrum disorder (ASD)

## Interventions and Practices Considered

1. Interventions for social skills, social communication, restricted and repetitive behaviors, and play performance and leisure participation
2. Interventions for sensory integration and sensory-based interventions
3. Interventions for performance in work, activities of daily living (ADLs), instrumental activities of daily living (IADLs), and education
4. Interventions for parent self-efficacy, family coping and resiliency, and family participation in daily life and routines

## Major Outcomes Considered

- Effectiveness of interventions
- Social skills
- Social communication
- Restricted and repetitive behaviors
- Play performance and leisure participation
- Parent self-efficacy

- Family coping and resiliency
- Sensory integration
- Work
- Activities of daily living (ADLs) and instrumental activities of daily living (IADLs)

## Methodology

### Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

### Description of Methods Used to Collect/Select the Evidence

The following four focused questions framed the reviews:

1. What is the evidence for the effectiveness of interventions within the scope of occupational therapy practice to improve social interaction, restricted and repetitive behaviors, play performance, and leisure participation for persons with autism spectrum disorder (ASD)?
2. What is the evidence for Ayres Sensory Integration® and sensory-based interventions within the scope of occupational therapy practice to improve performance in daily life activities and occupations for children with ASD?
3. What is the evidence for the effectiveness of interventions within the scope of occupational therapy practice to improve performance in activities of daily living, instrumental activities of daily living, education, work, rest, and sleep for persons with ASD?
4. What is the evidence for the effectiveness of interventions within the scope of occupational therapy practice for persons with ASD that improve parent self-efficacy, family coping and resiliency (including spouse and children), and family participation in daily life and routines?

Search terms for the reviews were developed by the methodology consultant to the American Occupational Therapy Association, Inc. (AOTA) Evidence-Based Practice Project and AOTA staff, in consultation with the review authors of each question, and by the advisory group. The search terms were developed not only to capture pertinent articles but also to ensure that the terms relevant to the specific thesaurus of each database were included. Table F.1 in the original guideline document lists the search terms related to the population (individuals with autism spectrum disorder [ASD]) and types of interventions included in each systematic review. A medical research librarian with experience in completing systematic review searches conducted all searches and confirmed and refined the search strategies. Databases and sites searched included Medline, PsycINFO, CINAHL, ERIC, and OTseeker. In addition, consolidated information sources, such as the Cochrane Database of Systematic Reviews, were included in the search. These databases are peer-reviewed summaries of journal articles and provide a system for clinicians and scientists to conduct systematic reviews of selected clinical questions and topics. Moreover, reference lists from articles included in the systematic reviews were examined for potential articles, and selected journals were hand searched to ensure that all appropriate articles were included.

Inclusion and exclusion criteria are critical to the systematic review process because they provide the structure for the quality, type, and years of publication of the literature that is incorporated into a review. The review of all four questions was limited to peer-reviewed scientific literature published in English. The intervention approaches examined were within the scope of practice of occupational therapy. The literature included in the review was published between 2006 and April 2013 and included study participants with ASD. (The earlier review included studies published between 1986 and 2006.) The review excluded data from presentations, conference proceedings, non-peer-reviewed research literature, dissertations, and theses. Studies included in the review are Level I–III evidence. Level IV and V evidence was included only when higher level evidence on a given topic was not found.

A total of 18,120 citations and abstracts were included in the reviews. For Question 1, there were 10,129 references; for Question 2, 885 references; for Question 3, 2,649 references; and for Question 4, 4,457 references. The consultant to the Evidence-Based Practice Project completed the first step of eliminating references based on citation and abstract. The systematic reviews were carried out as academic partnerships, in which academic faculty worked with graduate students to conduct the reviews. Review teams completed the next step of eliminating references based on citations and abstracts. The full-text versions of potential articles were retrieved, and the review teams determined final inclusion in the review based on predetermined inclusion and exclusion criteria.

## Number of Source Documents

A total of 146 articles were included in the final review. Table F.2 of the original guideline document presents the number and levels of evidence for articles included in each review question.

## Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

## Rating Scheme for the Strength of the Evidence

Levels of Evidence for Occupational Therapy Outcomes Research

Levels of Evidence	Definition
<b>Level I</b>	Systematic reviews, meta-analyses, and randomized, controlled trials
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<b>Level III</b>	One group, nonrandomized (e.g., before-after, pretest and posttest)
<b>Level IV</b>	Descriptive studies that include analysis of outcomes (e.g., single-subject design, case series)
<b>Level V</b>	Case reports and expert opinions, which include narrative literature reviews and consensus statements

Note: Adapted from "Evidence-based medicine: What it is and what it isn't." D. L. Sackett, W. M. Rosenberg, J. A. Muir Gray, R. B. Haynes, & W. S. Richardson, 1996, British Medical Journal, 312, pp. 71-72. Copyright © 1996 by the British Medical Association. Adapted with permission.

## Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

## Description of the Methods Used to Analyze the Evidence

The teams working on each focused question reviewed the articles according to their quality (scientific rigor and lack of bias) and levels of evidence. Each article included in the review was then abstracted using an evidence table that provides a summary of the methods and findings of the article. American Occupational Therapy Association, Inc. (AOTA) staff and the consultant to the Evidence-Based Practice Project reviewed the evidence tables to ensure quality control. All studies are summarized in full in the evidence tables in Appendix G of the original guideline document. An analysis of the articles included in the systematic reviews that served as the basis for this practice guideline was completed using risk-of-bias tables (see Appendix G).

## Methods Used to Formulate the Recommendations

Expert Consensus

## Description of Methods Used to Formulate the Recommendations

A major focus of the American Occupational Therapy Association, Inc. (AOTA)'s Evidence-Based Practice (EBP) projects is an ongoing program of systematic review of multidisciplinary scientific literature, using focused questions and standardized procedures to identify occupational therapy-relevant evidence and discuss its implications for practice, education, and research. An evidence-based perspective is founded on the assumption that scientific evidence of the effectiveness of occupational therapy intervention can be judged to be more or less strong and valid according to a hierarchy of research designs, an assessment of the quality of the research, or both.

AOTA uses standards of evidence modeled on those developed in evidence-based medicine. This model standardizes and ranks the value of scientific evidence for biomedical practice using a grading system presented in the "Rating Scheme for the Strength of the Evidence" field. In this system, the highest level of evidence, *Level I*, includes systematic reviews of the literature, meta-analyses, and randomized controlled trials (RCTs). In RCTs, participants are randomly allocated to either an intervention or a control group, and the outcomes of both groups are compared. Other levels of evidence include *Level II* studies, in which assignment to a treatment or a control group is not randomized (cohort study); *Level III* studies, which do not have a control group; *Level IV* studies, which use a single-case experimental design, sometimes reported over several participants; and *Level V* studies, which are case reports and expert opinion that include narrative literature reviews and consensus statements.

The systematic reviews on autism spectrum disorder (ASD) were supported by AOTA as part of the EBP Project. AOTA is committed to supporting the role of occupational therapy in this important area of practice. The previous review covered the time frame of 1986–2006. The current systematic reviews were updated for the period from 2006 to April 2013, because occupational therapy practitioners need access to the results of the latest and best available literature to support intervention within the scope of occupational therapy practice.

Four focused questions, based on the search strategy of the earlier review, were developed for the updated review. Additional search terms were added to ensure maximum coverage of the four questions. These questions were reviewed by review authors, an advisory group of experts in the field, AOTA staff, and the consultant to the AOTA EBP Project.

## Rating Scheme for the Strength of the Recommendations

### Strength of Recommendations

A—There is strong evidence that occupational therapy practitioners should routinely provide the intervention to eligible clients. Good evidence was found that the intervention improves important outcomes and concludes that benefits substantially outweigh harm.

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## Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

## Method of Guideline Validation

Peer Review

## Description of Method of Guideline Validation

This practice guideline was reviewed by a group of content experts in autism spectrum disorder (ASD) that included a consumer representative.

## Evidence Supporting the Recommendations

### Type of Evidence Supporting the Recommendations



The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

The final review included 146 articles. Studies included in the review are Level I–III evidence. Level IV and V evidence was included only when higher level evidence on a given topic was not found.

#### Number of Articles in Each Review at Each Level of Evidence

Review	Evidence Level					Total in Each Review
	I	II	III	IV	V	
Social	48	6	13	4	0	71
Sensory	8	1	2	12	0	23
Occupation-based	5	2	1	14	1	23
Parent self-efficacy	16	4	11	3	0	34
Total	77	13	27	33	1	151

## Benefits/Harms of Implementing the Guideline Recommendations

### Potential Benefits

This guideline may be used to assist:

- Occupational therapists and occupational therapy assistants in providing evidence-based interventions to individuals with autism spectrum disorder (ASD)
- Occupational therapists and occupational therapy assistants in communicating about their services to external audiences
- Policy, education, and health care benefit analysts in understanding the appropriateness of occupational therapy services for individuals with ASD
- Other health care practitioners, case managers, clients, families and caregivers, and health care facility managers in determining whether referral for occupational therapy services is appropriate
- Third-party payers in determining the medical or educational necessity for occupational therapy
- Legislators; third-party payers; federal, state, and local agencies; and administrators in understanding the professional education, training, and skills of occupational therapists and occupational therapy assistants
- Health and social services planning teams in determining the need for occupational therapy
- Program developers; administrators; legislators; federal, state, and local agencies; and third-party payers in understanding the scope of occupational therapy services
- Researchers, occupational therapists, occupational therapy assistants, program evaluators, and policy analysts in this practice area in determining outcome measures for analyzing the effectiveness of occupational therapy intervention
- Policymakers, legislators, and organizations in understanding the contribution occupational therapy can make in education, health promotion, program development, and health care reform to support individuals with ASD
- Occupational therapy educators in designing appropriate curricula that incorporate the role of occupational therapy with individuals with ASD

### Potential Harms

The studies that met the inclusion criteria for the systematic reviews did not explicitly report potential adverse events associated with the interventions that were evaluated. Before implementing any new intervention with a client, it is always prudent for the occupational therapy practitioner to be aware of the potential benefits and harms of the intervention. Clinical reasoning based on a sound evaluation of the client's strengths and limitations and an understanding of the intervention should be exercised to determine the potential benefits and harms of an intervention for an individual client.



# Qualifying Statements

## Qualifying Statements

- This guideline does not discuss all possible methods of care, and while it does recommend some specific methods of care, the occupational therapist makes the ultimate judgment regarding the appropriateness of a given procedure in light of a specific person's or group's circumstances and needs.
- This publication is designed to provide accurate and authoritative information in regard to the subject matter covered. It is sold or distributed with the understanding that the publisher is not engaged in rendering legal, accounting, or other professional service. If legal advice or other expert assistance is required, the services of a competent professional person should be sought.
- It is the objective of the American Occupational Therapy Association, Inc. (AOTA) to be a forum for free expression and interchange of ideas. The opinions expressed by the contributors to this work are their own and not necessarily those of AOTA.

## Implementation of the Guideline

### Description of Implementation Strategy

An implementation strategy was not provided.

### Implementation Tools

Chart Documentation/Checklists/Forms

Patient Resources

Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

## Institute of Medicine (IOM) National Healthcare Quality Report Categories

### IOM Care Need

Getting Better

Living with Illness

### IOM Domain

Effectiveness

Patient-centeredness

## Identifying Information and Availability

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## Adaptation

Not applicable: The guideline was not adapted from another source.

## Date Released

2016

## Guideline Developer(s)

American Occupational Therapy Association, Inc. - Professional Association

## Source(s) of Funding

American Occupational Therapy Association, Inc.

## Guideline Committee

Not stated

## Composition of Group That Authored the Guideline

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## Financial Disclosures/Conflicts of Interest

The authors of this practice guideline have signed a conflict-of-interest statement indicating that they have no conflicts that would bear on this work.

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This guideline meets NGC's 2013 (revised) inclusion criteria.

## Guideline Availability

Electronic copies: Not available at this time.

Print copies: Available for purchase from The American Occupational Therapy Association (AOTA), Inc., 4720 Montgomery Lane, Bethesda, MD 20814, Phone: 1-877-404-AOTA (2682), TDD: 800-377-8555, Fax: 301-652-7711. This guideline can also be ordered online at the [AOTA Web site](#) .

## Availability of Companion Documents

The following is available:

- Occupational therapy practice framework: domain and process. 3rd ed. Bethesda (MD): American Occupational Therapy Association, Inc. (AOTA); 2014. Available to order from the [American Occupational Therapy Association, Inc. \(AOTA\) Web site](#) .

In addition, the following are available in the original guideline document:

- Case studies for occupational therapy practice with individuals with autism spectrum disorder (ASD)
- Selected International Classification of Diseases (ICD)–9 and ICD–10 codes
- Selected Current Procedural Terminology (CPT)® codes for occupational therapy evaluations and interventions for individuals with ASD
- Brief history of ASD diagnosis and prevalence

A variety of autism resources are available from the [AOTA Web site](#) .

## Patient Resources

A variety of resources for families living with autism are available from the [American Occupational Therapy Association, Inc. \(AOTA\) Web site](#) .

## NGC Status

This NGC summary was completed by ECRI Institute on October 28, 2010. This summary was updated by ECRI Institute on October 20, 2016.

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